

## ABSTRACT

A method for demulsifying water-oil emulsions through ultrasonic action, comprises a step of making the water-oil emulsions flow through at least one ultrasonic acting region in a flow direction, wherein: within the ultrasonic acting region, a concurrent ultrasonic wave whose traveling direction is the same as the flow direction of the water-oil emulsions is generated by at least a one first ultrasonic transducer provided at the upstream end of the ultrasonic acting region, and at same time, a countercurrent ultrasonic wave whose traveling direction is opposite to the flow direction of the water-oil emulsions is generated by at least a one second ultrasonic transducer provided at the downstream end of the ultrasonic acting region; and the concurrent ultrasonic wave and the countercurrent ultrasonic wave act simultaneously on the water-oil emulsions which flow through the ultrasonic acting region, so as to demulsify the water-oil emulsions. After being demulsified, the water-oil emulsions gravity settle and separate, or settle and separate under an electric field, so as to be dewatered. The present invention can apply to various water-oil separating technologies in the procedures from mining to processing of crude oil.